

Abstract

Title: Signal separation method, signal processing apparatus, image processing apparatus, medical image processing apparatus and storage medium for restoring multidimensional signals from observed data in which multiple signals are mixed.

Signals are separated by introducing a function having a monotonously increasing characteristic like an exponential type function as a cost function, and applying an adaptive algorithm that minimizes that cost function in terms of a signal separation matrix. That is, there is provided a signal processing apparatus that separates and outputs an original signal from the observed signal $\underline{x}(t)$, in which multiple multidimensional signals are mixed, wherein the nonlinear function 21 is operated on an input observed signal $\underline{x}(t)$ and an estimated separation matrix $\underline{W}(t-1)$ estimated at a previous cycle. Then, an error signal $\underline{e}(t)$ is calculated 22 based on $\underline{y}(t)$ formed by this nonlinear function 21, the estimated separation matrix $\underline{W}(t-1)$ estimated at the previous cycle, and the observed signal $\underline{x}(t)$ at that time. Then, based on the calculated error signal $\underline{e}(t)$, the update of the separation matrix $\underline{W}(t)$ at that time is performed 23 such that consideration weight is increased when estimation errors are large using the cost function having a monotonously increasing characteristic.